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(54) **OPTICAL SYSTEM WITH DISPERSION COMPENSATION**

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(57) **ABSTRACT**

Systems and methods of dispersion compensation in an optical device are disclosed. A holographic optical element may include a set of different holograms in a grating medium. Each hologram in the set may have a corresponding grating vector with a grating frequency and direction. The directions of the grating vectors may vary as a function of the grating frequency. Different holograms in the set may diffract light in a particular direction so that the light emerges from a boundary of the grating medium in a single given direction regardless of wavelength. A prism may be used to couple light into the grating medium. The prism may be formed using materials having dispersion properties that are similar to the dispersion properties of the grating material. The prism may have an input face that receives perpendicular input light. The prism may include multiple portions having different refractive indices.